IN THE CLAIMS

I CLAIM:

1. (Currently Amended) ~~An Ethernet~~ transceiver comprising:

the transceiver receiving a plurality of digital signal streams, at least one of the plurality of digital signal streams being coupled to another of the plurality of digital signal streams;

a transform block for transforming ~~a~~ the plurality of the digital signal streams from an original domain into a lower complexity domain;

a processor for joint processing of the transformed plurality of digital signal streams, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed plurality digital signal streams by a processing matrix; and

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain;

wherein the transceiver is receiving the plurality of digital signal streams, and the off-diagonal elements of the processing matrix are selected to cancel transmission cross-talk of the plurality of digital signal streams introduced during transmission of the plurality of digital signal streams.

2. (Canceled) The transceiver of claim 1, wherein the joint processing includes multiplying samples of the digital signal streams by a processing matrix.

3. (Currently amended) The transceiver of claim ~~2~~ 1, wherein diagonal elements of the processing matrix are also selected to reduce inter-symbol interference of the plurality of digital signal streams.

4. (Currently amended) The transceiver of claim 3, wherein the diagonal elements of the processing matrix are adaptively selected.

5. (Currently amended) The transceiver of claim 4, wherein the diagonal elements of the processing matrix are adaptively selected depending upon signal coupling and inter-symbol interference measurements.

6. (Currently amended) The transceiver of claim ~~2~~ 1, wherein off-diagonal elements of the processing matrix are selected to reduce cross-talk between the digital signal streams.

7. (Currently amended) ~~The transceiver of claim 6,~~ A transceiver comprising:

the transceiver receiving a plurality of digital signal streams, at least one of the plurality of digital signal streams being coupled to another of the plurality digital signal streams;

a transform block for transforming the plurality of the digital signal streams from an original domain into a lower complexity domain;

a processor for joint processing of the transformed plurality of digital signal streams, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed plurality of digital signal streams by a processing matrix, wherein off-diagonal elements of the processing matrix are selected to reduce cross-talk between the plurality of digital signal streams, and wherein the off-diagonal elements of the processing matrix are adaptively selected;

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain.

8. (Original) The transceiver of claim 7, wherein off-diagonal elements of the processing matrix are adaptively selected depending upon signal coupling and inter-symbol interference measurements.

9. ~~The transceiver of claim 2,~~ A transceiver comprising:

the transceiver receiving a plurality of digital signal streams for transmission;

a transform block for transforming the plurality of the digital signal streams from an original domain into a lower complexity domain;

a processor for joint processing of the transformed plurality of digital signal streams, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed plurality of digital signal streams by a processing matrix;

an inverse transform block for inverse transforming the joint processed digital signal streams back to the original domain; and

wherein the transceiver is transmitting the inverse transformed joint processed digital signal streams, and the off-diagonal elements of the processing matrix are selected to provide process cross-talk between the digital signal streams, which cancel transmission cross-talk of the digital signal streams introduced during transmission of the transformed joint processed ~~digital~~ signal streams.

10. (Canceled) The transceiver of claim 2, wherein the transceiver is receiving the digital signal streams, and the off-diagonal elements of the processing matrix are selected to cancel transmission cross-talk of the digital signal streams introduced during transmission of the digital signal streams.

11. (Currently amended) ~~The transceiver of claim 2,~~ A transceiver comprising:

the transceiver receiving a plurality of digital signal streams, at least one digital signal stream being coupled to another of the digital signal streams;

a transform block for transforming the plurality of the digital signal streams from an original domain into a lower complexity domain;

a processor for joint processing of the transformed plurality digital signal streams, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed digital signal streams by a processing matrix;

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain; and

wherein the transceiver is receiving the plurality of digital signal streams, and the diagonal elements of the processing matrix are selected to cancel transmission echo cross-talk of the plurality digital signal streams introduced during reception of the digital signal streams.

12. (Currently amended) The transceiver of claim 1, wherein at least one plurality of digital signal streams includes time domain processing.

13. (Currently amended) The transceiver of claim 1, wherein the joint processing of the transformed signal streams is additionally performed on signal streams to be transmitted.

14. (Currently amended) The transceiver of claim 1, wherein the joint processing of the transformed plurality of signal streams is performed on received signal streams.

15. (Original) The transceiver of claim 1, including N digital signal streams, and M joint processed signal streams.

16. (Original) The transceiver of claim 1, including N digital signal streams, and a single joint processed signal stream.

17. (Currently amended) The transceiver of claim 1, wherein the transceiver further comprises a filter that comprises filtering coefficients, and the transform block additionally transforms the filtering coefficients.

18. (Original) The transceiver of claim 1, wherein the transceiver further comprises a filter that comprises filtering coefficients, and the filtering coefficients of the joint processing are determined to reduce interference between Ethernet digital signal streams.

19. (Original) The transceiver of claim 18, wherein the filtering coefficients include a transfer domain representation of a time domain filter.

20. (Currently amended) The transceiver of claim 1, wherein the plurality digital signal streams are ~~transmitted~~ received over an Ethernet network.

21. (Original) The transceiver of claim 1, wherein the joint processing provides reduction of near end cross talk.

22. (Original) The transceiver of claim 1, wherein the joint processing provides reduction of alien near end cross talk.

23. (Original) The transceiver of claim 1, wherein the joint processing provides reduction of far end cross talk.

24. (Currently amended) The transceiver of claim ~~1~~ 11, wherein the joint processing provides reduction of echo signal interference.

25. (Currently amended) The transceiver of claim ~~1~~ 11, wherein the joint processing provides reduction of inter-symbol interference.

26. (Currently amended) A transceiver comprising:

the transceiver receiving a plurality of digital signal streams, at least one of the plurality of digital signal stream being coupled to another of the plurality of digital signal streams;

a transform block transforming ~~a~~ the plurality of the digital signal streams from an original domain into a new domain that allows for less complex processing;

a processor for joint processing of the transformed digital signal streams in the new domain, each of the joint processed digital signal

streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the plurality of transformed digital signal streams by a processing matrix;

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain;

wherein the transceiver is receiving the plurality digital signal streams, and the off-diagonal elements of the processing matrix are selected to cancel transmission cross-talk of the plurality of digital signal streams introduced during transmission of the plurality of digital signal streams.

27. (Currently amended) A transmitter comprising:

the transceiver receiving a plurality of digital signal streams for transmission, at least one of the plurality of digital signal streams being coupled to another of the plurality of digital signal streams;

a transform block transforming a the plurality of the digital signal streams from an original domain into a new domain that allows for less complex processing;

a processor for joint processing of the transformed plurality of digital signal streams in the new domain, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the plurality of transformed digital signal streams by a processing matrix;

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain;

wherein the transceiver is transmitting the inverse transformed joint processed digital signal streams, and the off-diagonal elements of the processing matrix are selected to provide process cross-talk between the digital signal streams, which cancel transmission cross-talk of the digital signal streams introduced during transmission of the transformed joint processed signal streams;

an analog front end for transmitting the joint processed signal streams.

28. (Currently amended) A receiver comprising:

an analog front end for receiving analog signal streams, and generating a plurality of digital signal streams, at least one of the plurality of digital signal streams being coupled to another of the plurality of digital signal streams;

a transform block transforming a the plurality of the digital signal streams from an original domain into a new domain that allows for less complex processing;

a processor for joint processing of the transformed plurality of digital signal streams in the new domain, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed plurality digital signal streams by a processing matrix;

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain;

wherein the transceiver is receiving the plurality of digital signal streams, and the off-diagonal elements of the processing matrix are selected to cancel transmission cross-talk of the plurality of digital signal streams introduced during transmission of the plurality digital signal streams. ~~; and~~

~~an analog front end for transmitting the joint processed signal streams.~~

29. (Currently amended) A method of joint processing a plurality of digital signal streams;

transforming a plurality of the digital signal streams from an original domain into a lower complexity processing domain;

joint processing of the transformed plurality of digital signal streams, each of the joint processed digital signal streams being influenced by characteristics of other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the plurality of transformed digital signal streams by a processing matrix;

inverse transforming the joint processed signal streams back to the original domain[.]; and

selecting off-diagonal elements of the processing matrix to cancel transmission cross-talk of the plurality digital signal streams introduced during transmission of the plurality digital signal streams

30. (Currently amended) The method of joint processing of claim 29, wherein ~~the transform block~~ transforming a plurality of the digital signal streams from an original domain into a lower complexity processing domain additionally transforms filtering coefficients.

31. (Original) The method of joint processing of claim 29, wherein a maximal amount of Ethernet signal interference minimization processing is performed in the lower complexity domain.

32. (Original) The method of joint processing of claim 29, wherein filtering coefficients of the joint processing are determined to minimize interference between Ethernet digital signal streams.

33. (Currently amended) The method of joint processing of claim 29, wherein the plurality of digital signal streams are transmitted over an Ethernet network.

34. (Original) The method of joint processing of claim 29, wherein the joint processing provides reduction of near end cross talk.

35. (Original) The method of joint processing of claim 29, wherein the joint processing provides reduction of alien near end cross talk.

36. (Original) The method of joint processing of claim 29, wherein the joint processing provides reduction of far end cross talk.

37. (Canceled) The method of joint processing of claim 29, wherein the joint processing provides reduction of inter-symbol interference.

38. (Cancelled) The method of joint processing of claim 29, wherein the joint processing provides reduction of echo signal interference.

39. (Currently amended) A network line card, the network line card comprising a bi-directional transceiver, the bi-directional transceiver comprising:

the transceiver receiving a plurality of digital signal streams, at least one of the plurality of digital signal streams being coupled to another of the plurality of digital signal streams;

a transform block for transforming a the plurality of the digital signal streams from an original domain into a lower complexity domain;

a processor for joint processing of the transformed plurality of digital signal streams, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed plurality digital signal streams by a processing matrix; and

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain;

wherein the transceiver is receiving the plurality of digital signal streams, and the off-diagonal elements of the processing matrix are selected to cancel transmission cross-talk of the plurality of digital signal streams introduced during transmission of the plurality of digital signal streams.

40. (Currently amended) A server comprising a bi-directional transceiver, the bi-directional transceiver comprising:

the transceiver receiving a plurality of digital signal streams, at least one of the plurality of digital signal streams being coupled to another of the plurality of digital signal streams;

a transform block for transforming a the plurality of the digital signal streams from an original domain into a lower complexity domain;

a processor for joint processing of the transformed plurality of digital signal streams, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed plurality digital signal streams by a processing matrix; and

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain;

wherein the transceiver is receiving the plurality of digital signal streams, and the off-diagonal elements of the processing matrix are selected to cancel transmission cross-talk of the plurality of digital signal streams introduced during transmission of the plurality of digital signal streams.

41. (Currently amended) A LAN system comprising a bi-directional transceiver, the bi-directional transceiver comprising:

the transceiver receiving a plurality of digital signal streams, at least one of the plurality of digital signal streams being coupled to another of the plurality of digital signal streams;

a transform block for transforming a the plurality of the digital signal streams from an original domain into a lower complexity domain;

a processor for joint processing of the transformed plurality of digital signal streams, each of the joint processed digital signal streams being influenced by other of the joint processed digital signal streams, wherein the joint processing includes multiplying samples of the transformed plurality digital signal streams by a processing matrix; and

an inverse transform block for inverse transforming the joint processed signal streams back to the original domain;

wherein the transceiver is receiving the plurality of digital signal streams, and the off-diagonal elements of the processing matrix are selected to cancel transmission cross-talk of the plurality of digital signal streams introduced during transmission of the plurality of digital signal streams.

42. (New) The transceiver of claim 11, wherein the diagonal elements of the processing matrix are also selected to reduce inter-symbol interference of the digital signal streams.

43. (New) The transceiver of claim 11, wherein the diagonal elements of the processing matrix are adaptively selected.

44. (New) The transceiver of claim 11, wherein diagonal elements of the processing matrix are adaptively selected depending upon signal coupling and inter-symbol interference measurements.